

WHAT IS CLAIMED IS:

- 1 1. An image processing method, performed by an image supply device
2 storing image data and an image output device performing image processing
3 with respect to the image data, which are connected via a communication path
4 through which the image data is communicated, the method comprising steps
5 of:
6 generating a control information item including a script for the image
7 processing which is described by a markup language; and
8 communicating the control information item between the image supply
9 device and the image output device, the communicating step comprising:
10 interpreting a control protocol for communicating the control
11 information item, by a first entity which executes processing for a first
12 hierarchic layer of a communication protocol;
13 interpreting a management protocol for managing an image data
14 file including the image data, by a second entity which executes processing for
15 a second hierarchic layer of the communication protocol which is lower than
16 the first hierarchic layer;
17 controlling a physical layer of the communication path, by a third
18 entity which executes processing for a third hierarchic layer of the
19 communication protocol which is lower than the second hierarchic layer, and
20 translating a command in the control information item between the
21 control protocol and the management protocol.

1 2. The image processing method as set forth in claim 1, wherein the
2 management protocol is one of a picture transfer protocol (PTP) or a mass
3 storage class of a universal serial bus (USB).

1 3. The image processing method as set forth in claim 1, wherein the
2 third entity controls a universal serial bus (USB).

1 4. The image processing method as set forth in claim 3, wherein a still
2 image capture device class is used for the USB.

1 5. The image processing method as set forth in claim 1, wherein the
2 second entity manages the image data file through use of a predetermined file
3 system.

1 6. The image processing method as set forth in claim 1, wherein the
2 third entity controls one of a wireless local area network (LAN) and a peer to
3 peer wireless data communication.

1 7. An image processing system, comprising:
2 an image supply device, operable to store image data; and
3 an image output device, connected to the image supply device via a
4 communication path through which the image data is communicated, and
5 operable to perform image processing with respect to the image data,
6 wherein each of the image supply device and the image output device
7 comprises:

8 a communication controller, operable to communicate, between the
9 image supply device and the image output device, a control information item
10 including a script for the image processing which is described by a markup
11 language;

12 a first entity, operable to execute processing for a first hierarchic
13 layer of a communication protocol, and to interpret a control protocol for
14 communicating the control information item;

15 a second entity, operable to execute processing for a second
16 hierarchic layer of the communication protocol of the communication protocol
17 which is lower than the first hierarchic layer, and to interpret a management
18 protocol for managing an image data file including the image data;

19 a third entity, operable to execute processing for a third hierarchic
20 layer of the communication protocol of the communication protocol which is
21 lower than the second hierarchic layer, and to control a physical layer of the
22 communication path; and

23 a translator, which translates a command in the control information
24 item between the control protocol and the management protocol.

1 8. An image output device, connected to an image supply device storing
2 image data via a communication path, the image output device comprising:

3 a communication controller, operable to communicate, between the
4 image supply device and the image output device, a control information item
5 including a script for the image processing which is described by a markup
6 language;

7 a first entity, operable to execute processing for a first hierarchic layer

8 of a communication protocol, and to interpret a control protocol for
9 communicating the control information item;

10 a second entity, operable to execute processing for a second
11 hierarchic layer of the communication protocol of the communication protocol
12 which is lower than the first hierarchic layer, and to interpret a management
13 protocol for managing an image data file including the image data;

14 a third entity, operable to execute processing for a third hierarchic
15 layer of the communication protocol of the communication protocol which is
16 lower than the second hierarchic layer, and to control a physical layer of the
17 communication path; and

18 a translator, which translates a command in the control information
19 item between the control protocol and the management protocol.

1 9. A computer program product comprising a computer program which
2 causes a computer to serve as the communication controller, the first entity,
3 the second entity, the third entity, and the translator in the image output device
4 as set forth in claim 8.

1 10. An image supply device, connected to an image output device
2 performing image processing via a communication path, the image supply
3 device comprising:

4 a storage, which stores image data to be subjected to the image
5 processing;

6 a communication controller, operable to communicate, between the
7 image supply device and the image output device, a control information item

8 including a script for the image processing which is described by a markup
9 language;
10 a first entity, operable to execute processing for a first hierarchic layer
11 of a communication protocol, and to interpret a control protocol for
12 communicating the control information item;
13 a second entity, operable to execute processing for a second
14 hierarchic layer of the communication protocol of the communication protocol
15 which is lower than the first hierarchic layer, and to interpret a management
16 protocol for managing an image data file including the image data;
17 a third entity, operable to execute processing for a third hierarchic
18 layer of the communication protocol of the communication protocol which is
19 lower than the second hierarchic layer, and to control a physical layer of the
20 communication path; and
21 a translator, which translates a command in the control information
22 item between the control protocol and the management protocol.

1 11. A computer program product comprising a computer program which
2 causes a computer to serve as the communication controller, the first entity,
3 the second entity, the third entity, and the translator in the image supply device
4 as set forth in claim 8.

1 12. An image processing method, performed by an image supply device
2 storing image data and an image output device performing image processing
3 with respect to the image data which are connected via a communication path
4 through which the image data is communicated, the method comprising steps

5 of:
6 generating a control information item including a script for the image
7 processing which is described by a markup language; and
8 communicating the control information item between the image supply
9 device and the image output device, the communicating step comprising:
10 interpreting a control protocol for communicating the control
11 information item, by a first entity which executes processing for a first
12 hierarchic layer of a communication protocol;
13 selecting one of second entities each executes processing for a
14 second hierarchic layer of the communication protocol which is lower than the
15 first hierarchic layer;
16 selecting one of third entities each executes processing for a third
17 hierarchic layer of the communication protocol which is lower than the second
18 hierarchic layer;
19 interpreting a management protocol for managing an image data
20 file including the image data, by the selected one of the second entities;
21 controlling a physical layer of the communication path, by the
22 selected one of the third entities; and
23 translating a command in the control information item between the
24 control protocol and the management protocol.

1 13. The image processing method as set forth in claim 12, wherein the
2 management protocol is one of a picture transfer protocol (PTP) or a mass
3 storage class of a universal serial bus (USB).

1 14. The image processing method as set forth in claim 12, wherein the
2 selected one of the third entities controls a universal serial bus (USB).

1 15. The image processing method as set forth in claim 14, wherein a still
2 image capture device class is used for the USB.

1 16. The image processing method as set forth in claim 12, wherein the
2 selected one of the second entities manages the image data file through use of
3 a predetermined file system.

1 17. The image processing method as set forth in claim 12, wherein the
2 selected one of the third entities controls one of a wireless local area network
3 (LAN) and a peer to peer wireless data communication.

1 18. The image processing method as set forth in claim 17, wherein the
2 selected one of the second entities is valid in both of the image supply device
3 and the image output device.

1 19. The image processing method as set forth in claim 17, wherein the
2 selecting step is performed in accordance with a state of the communication
3 path.

1 20. The image processing method as set forth in claim 19, wherein the
2 selecting step is performed based on a priority table such that one of the
3 second entities and one of the third entities having respectively a relatively

4 higher order in the priority table are selected prior to ones having a relatively
5 lower order in the priority table.

1 21. An image processing system, comprising:
2 an image supply device, operable to store image data; and
3 an image output device, connected to the image supply device via a
4 communication path through which the image data is communicated, and
5 operable to perform image processing with respect to the image data,
6 wherein each of the image supply device and the image output device
7 comprises:
8 a communication controller, operable to communicate, between the
9 image supply device and the image output device, a control information item
10 including a script for the image processing which is described by a markup
11 language;
12 a first entity, operable to execute processing for a first hierarchic
13 layer of a communication protocol, and to interpret a control protocol for
14 communicating the control information item;
15 a plurality of second entities, each operable to execute processing
16 for a second hierarchic layer of the communication protocol of the
17 communication protocol which is lower than the first hierarchic layer, and to
18 interpret a management protocol for managing an image data file including the
19 image data;
20 a plurality of third entities, each operable to execute processing for
21 a third hierarchic layer of the communication protocol of the communication
22 protocol which is lower than the second hierarchic layer, and to control a

23 physical layer of the communication path;
24 a selector, which selects one of the second entities and a third
25 entities; and
26 a translator, which translates a command in the control information
27 item between the control protocol and the management protocol interpreted by
28 the selected one of the second entities.

1 22. An image output device, connected to an image supply device storing
2 image data via a communication path, the image output device comprising:
3 a communication controller, operable to communicate, between the
4 image supply device and the image output device, a control information item
5 including a script for the image processing which is described by a markup
6 language;
7 a first entity, operable to execute processing for a first hierarchic layer
8 of a communication protocol, and to interpret a control protocol for
9 communicating the control information item;
10 a plurality of second entities, each operable to execute processing for
11 a second hierarchic layer of the communication protocol of the communication
12 protocol which is lower than the first hierarchic layer, and to interpret a
13 management protocol for managing an image data file including the image
14 data;
15 a plurality of third entities, each operable to execute processing for a
16 third hierarchic layer of the communication protocol of the communication
17 protocol which is lower than the second hierarchic layer, and to control a
18 physical layer of the communication path;

19 a selector, which selects one of the second entities and a third
20 entities; and

21 a translator, which translates a command in the control information
22 item between the control protocol interpreted by the first entity and the
23 management protocol interpreted by the selected one of the second entities.

1 23. A computer program product comprising a computer program which
2 causes a computer to serve as the communication controller, the first entity,
3 the second entity, the third entity, the selector, and the translator in the image
4 output device as set forth in claim 21.

5
1 24. An image supply device, connected to an image output device
2 performing image processing via a communication path, the image supply
3 device comprising:

4 a storage, which stores image data to be subjected to the image
5 processing;

6 a communication controller, operable to communicate, between the
7 image supply device and the image output device, a control information item
8 including a script for the image processing which is described by a markup
9 language;

10 a first entity, operable to execute processing for a first hierarchic layer
11 of a communication protocol, and to interpret a control protocol for
12 communicating the control information item;

13 a plurality of second entities, each operable to execute processing for
14 a second hierarchic layer of the communication protocol of the communication

15 protocol which is lower than the first hierarchic layer, and to interpret a
16 management protocol for managing an image data file including the image
17 data;

18 a plurality of third entities, each operable to execute processing for a
19 third hierarchic layer of the communication protocol of the communication
20 protocol which is lower than the second hierarchic layer, and to control a
21 physical layer of the communication path;

22 a selector, which selects one of the second entities and a third
23 entities; and

24 a translator, which translates a command in the control information
25 item between the control protocol interpreted by the first entity and the
26 management protocol interpreted by the selected one of the second entities.

1 25. A computer program product comprising a computer program which
2 causes a computer to serve as the communication controller, the first entity,
3 the second entity, the third entity, and the translator in the image supply device
4 as set forth in claim 24.